REMARKS

This Amendment is submitted in reply to the final Office Action mailed on July 29, 2011. No fees are believed to be due herewith this Amendment. The Director is authorized to charge any fees that may be required, or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 3712036-00742 on the account statement.

Claims 1-29 are pending in the application. Claims 14-29 were previously withdrawn. In the Office Action, Claims 1-13 are rejected under 35 U.S.C. §103. In response, Claim 1 has been amended and Claim 9 has been canceled. The amendments do not add new matter and are supported in the specification at, for example, page 10, lines 4-8; page 14, lines 9-17; page 16, lines 7-15; and page 20, lines 15-23. In view of the amendments and/or for at least the reasons set forth below, Applicants respectfully request that the rejections be reconsidered and withdrawn.

In the Office Action, Claims 1-6, 8 and 11-13 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,345,781 to Fels et al. ("*Fels*") in view of U.S. Patent No. 5,024,066 to Goavec ("*Goavec*"). In view of the amendments and/or for at least the reasons set forth below, Applicants respectfully submit that the cited references are deficient with respect to the present claims.

Currently amended independent Claim 1 recites, in part, a low temperature extrusion process comprising locally adjusting, in at least 3 zones of the extruder screw, width variation of cuts in a screw flight, the process providing a viscosity-adapted increase in shear treatment in a first 25% to 70% of a length of the extruder measured from an extruder inlet such that after about half or two-thirds of the extruder length a freezing degree of greater than 55% to 60% frozen water fraction related to the freezable water is reached. The amendments do not add new matter and are supported in the specification at, for example, page 10, lines 4-8; page 14, lines 9-17; page 16, lines 7-15; and page 20, lines 15-23. The present disclosure is based on the optimization of the energy input provided during a low temperature freezing extrusion process applied to a partially frozen mass. The present disclosure has the double aim of (i) generating a homogeneous finer microstructure in the frozen mass, and (ii) optimizing the conditions for the transfer of dissipated and phase transition heat generated during the process.

More particularly, the present claims are based on the fact that the energy input provided during the extrusion process is modified along the extruder length, by zones, thus generating an input which is locally (in each zone) adapted to the local heat transfer. Practically, as the partially frozen mass goes along the extruder, its viscosity increases (with the increase of frozen water fraction) and as a consequence the dissipated heat provided by the friction and the crystallization increases as well. A gradient of mechanical energy is provided by adjusting the shear treatment to the local viscosity of the mass, which allows finer dispersing of the microstructure components (ice crytals, air bubbles/air cells, fat globule agglomerates) and optimized conditions for the heat transfer. Applicants respectfully submit that *Fels* and *Goavec* fail to disclose or suggest each and every element of the present claims.

For example, *Fels* and *Goavec* fail to disclose or suggest a low temperature extrusion process comprising locally adjusting, in at least 3 zones of the extruder screw, width variation of cuts in a screw flight, the process providing a viscosity-adapted increase in shear treatment in a first 25% to 70% of a length of the extruder measured from an extruder inlet such that after about half or two-thirds of the extruder length a freezing degree of greater than 55% to 60% frozen water fraction related to the freezable water is reached as recited, in part, by currently amended independent Claim 1. Instead, *Fels* is entirely direct to a device designed such as to cool down edible foams to storage temperature on a continuous basis, with good mixing and uniform and homogeneous removal of heat. See, *Fels*, column 6, lines 18-21. The device of *Fels* includes at least a double screw system with two screws positioned parallel to each other. The device for deep freezing, according to *Fels,* implements an essentially homogeneous mechanical energy input, based on the use of a special double screw system. See, *Fels*, column 6, lines 54-56.

Fels therefore differs from the present claims, in part, in that the mechanical energy input is homogeneous during the extrusion process, while the mechanical treatment is modified and raised or zone-wise adapted to the local viscosity of the partially frozen mass during the extrusion freezing process according to Claim 1. In other words, *Fels* fails to disclose or suggest any process comprising the application of a gradient of mechanical energy along the extruder, as a function of the viscosity increase of the partially frozen mass, and *Fels* fails to disclose locally adjusting parameters over the length of the extruder screw channel.

Fels also fails to disclose or suggest a process providing a viscosity-adapted increase in shear treatment in the first 25% to 70% of the extruder channel length such that after half or two-thirds of the extruder length, a freezing degree of greater than 55-60% frozen water fraction is reached, by multiple adjustments over the length of the extruder of various parameters. For instance, *Fels* discloses adjusting a rotation screw speed of an extruder screw. See, *Fels*, column 7, lines 51-55. However, such adjustment refers to the speed of the double shaft system, which is controlled as a function of the consistency of the end product. While there is a local adjustment made, but high mechanical treatment is only reached in the end zone of the low temperature extruder close the outlet walls. This is entirely distinguishable from the present claims, wherein the increase in shear treatment happens in the first 25% to 70% of the extruder channel length.

Further, *Govaec* also fails to disclose or suggest a low temperature extrusion process comprising locally adjusting, in at least 3 zones of the extruder screw, width variation of cuts in a screw flight, the process providing a viscosity-adapted increase in shear treatment in a first 25% to 70% of a length of the extruder measured from an extruder inlet such that after about half or two-thirds of the extruder length a freezing degree of greater than 55% to 60% frozen water fraction related to the freezable water is reached as recited, in part, by independent Claim 1. Instead, *Govaec* describes an installation for making ice creams comprising a freezing system to cool and homogenize the product. The freezing system is characterized by stirring means comprising Archimedes' screw furnished on its periphery with scraper knives. See, *Govaec*, Abstract. Although emphasizing the importance of the quality of shearing, *Govaec* is silent about modifying the energy input along various zones of an extruder as a function of the increasing viscosity of a partially frozen mass. Because *Fels* and *Govaec* fail to disclose or suggest at least local adjustments of parameters along the length of the extruder, *Fels* and *Govaec*, alone or in combination, are deficient with respect to the present claims.

For at least the reasons discussed above, Applicants respectfully submit that Claims 1-6, 8 and 11-13 are novel, nonobvious and distinguishable from the cited reference.

Accordingly, Applicant respectfully requests that the obviousness rejections with respect to Claims 1-6, 8 and 11-13 be reconsidered and the rejections be withdrawn.

In the Office Action, Claims 7, 9 and 10 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Fels* in view of *Goavec* as applied above and in further view of U.S. Patent No. 5,221,504 to Capelle ("*Capelle*"). Applicants respectfully submit that the patentability of Claim 1 as previously discussed renders moot the obviousness rejection of Claims 7, 9 and 10 that depend from Claim 1. In this regard, the cited art fails to teach or suggest the elements of Claims 7, 9 and 10 in combination with the novel elements of Claim 1.

Further, *Capelle* also fails to disclose or suggest a low temperature extrusion process comprising locally adjusting, in at least 3 zones of the extruder screw, width variation of cuts in a screw flight, the process providing a viscosity-adapted increase in shear treatment in a first 25% to 70% of a length of the extruder measured from an extruder inlet such that after about half or two-thirds of the extruder length a freezing degree of greater than 55% to 60% frozen water fraction related to the freezable water is reached as recited, in part, by independent Claim 1. Instead, *Capelle* is entirely directed to an apparatus having a pin-lined barrel section and a Transfermix section for increasing the material throughput and mixing quality of an extruder. See, *Capelle*, Abstract. Because the cited references fail to disclose or suggest each and every element of the present claims, the cited references, alone or in combination, are deficient with respect to the present claims.

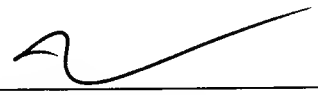
For at least the reasons discussed above, Applicants respectfully submit that Claims 7, 9 and 10 are novel, nonobvious and distinguishable from the cited reference.

Accordingly, Applicant respectfully requests that the obviousness rejections with respect to Claims 7, 9 and 10 be reconsidered and the rejections be withdrawn.

For the foregoing reasons, Applicants respectfully request reconsideration of the above-identified patent application and earnestly request an early allowance of the same. In the event there remains any impediment to allowance of the claims which could be clarified in a telephonic interview, the Examiner is respectfully requested to initiate such an interview with the undersigned.

Respectfully submitted,

K&L GATES LLP

BY 

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Dated: October 31, 2011